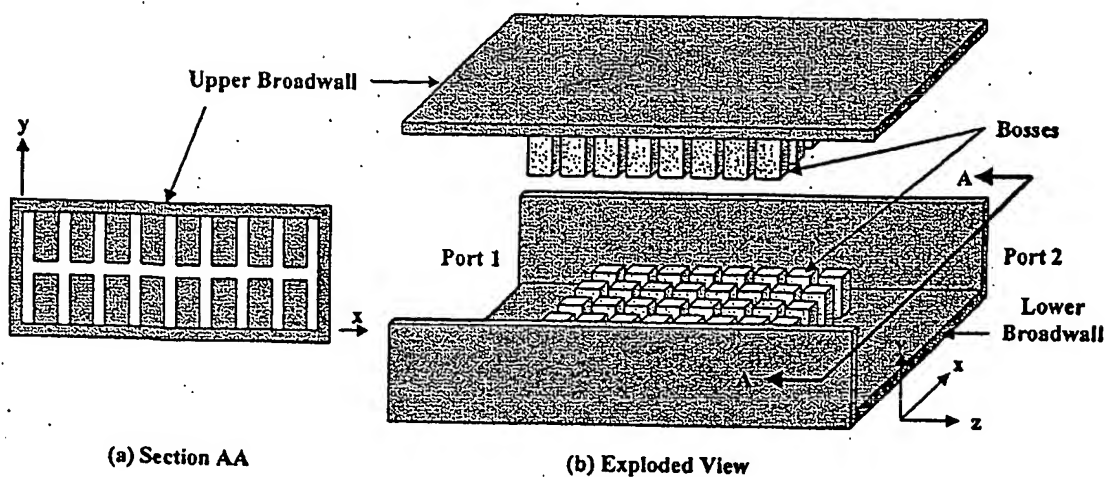


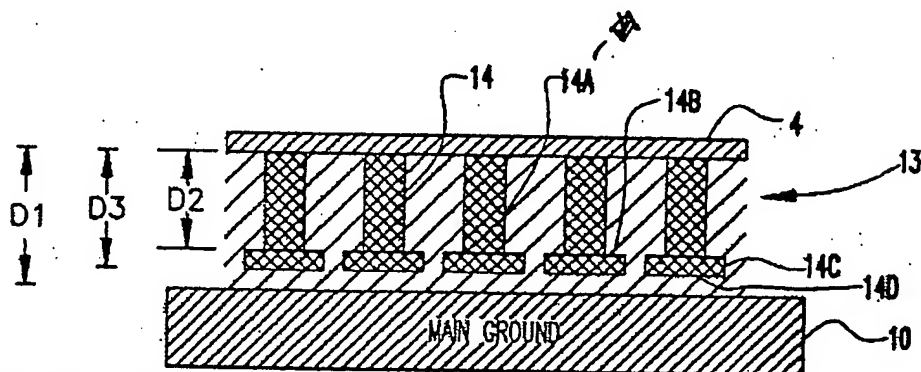


Replacement Drawings
 Title: Systems and Methods For Blocking Microwave
 Propagation in Parallel Plate Structures Utilizing Cluster Vias
 Serial No. 10/828,542 - filed: 04/19/04
 Inventor: McKinzie
 Docket No. 42372-0004
 1/16

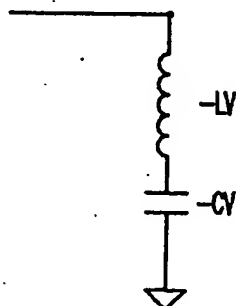


Waffle-Iron Waveguide Filter: (a) view looking into port 2, (b) exploded view.

Prior Art FIG. 1

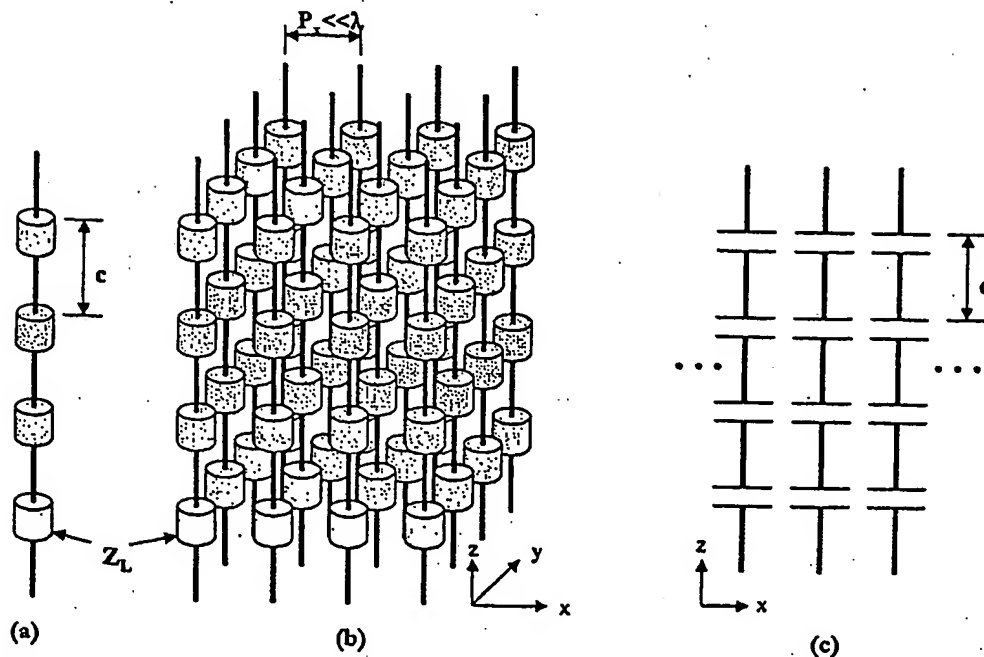


Prior Art FIG. 2



Prior Art

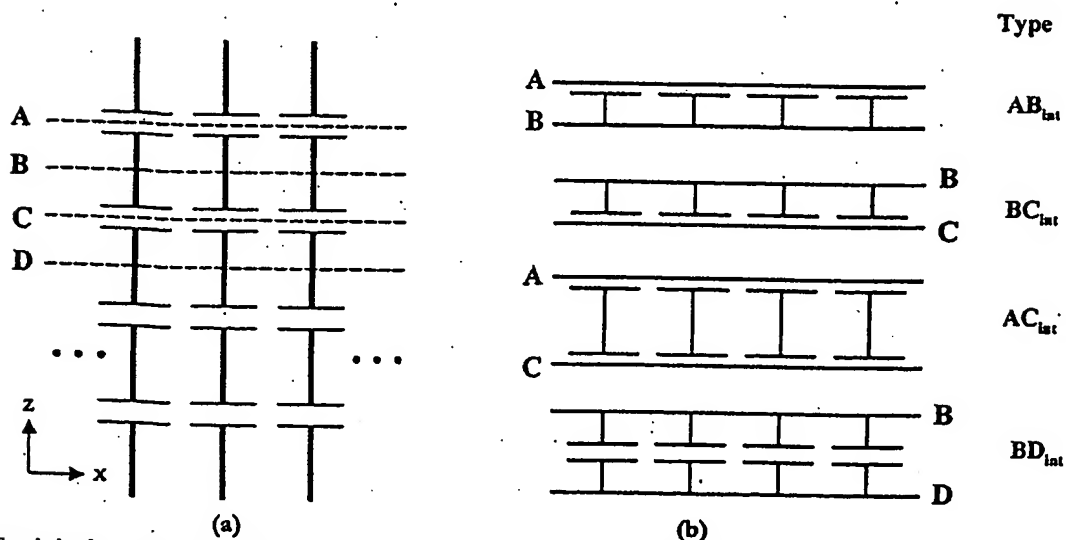
FIG. 3



The starting point for the derivation of new inventions is the loaded wire media: (a) a single wire with uniform periodic series loads, (b) a rectangular array of loaded wires, (c) loads are now defined as parallel-plate capacitors.

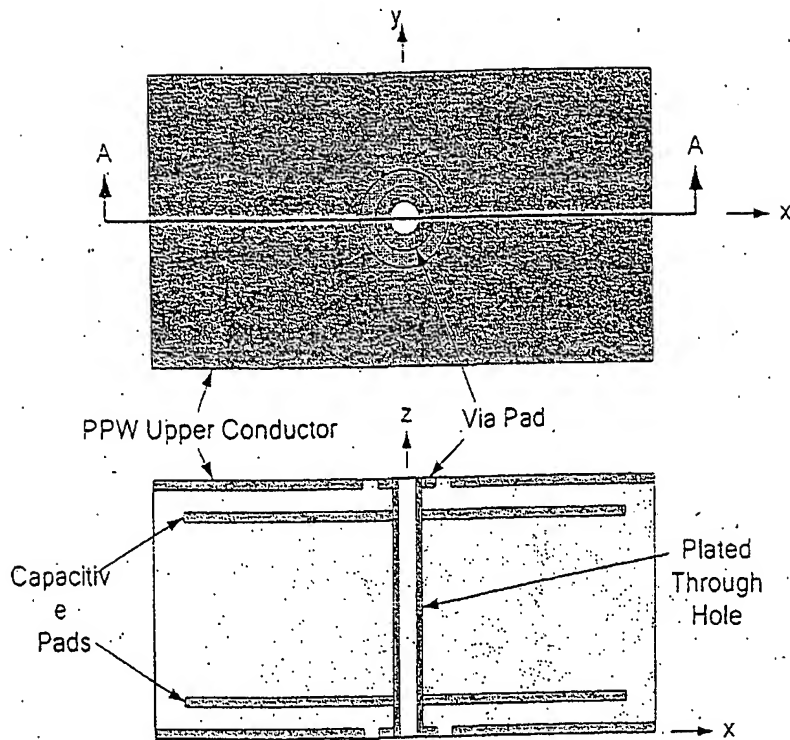
Prior Art

FIG. 5



Exploit the planes of physical symmetry to obtain electromagnetically equivalent structures: (a) the infinite wire media, (b) PPW structures of finite height. The supporting dielectric structure is not shown.

FIG. 6



Plated through holes may be used in the fabrication of resonant vias as illustrated here for an internal I resonant via.

FIG. 21

	Mechanically-Unbalanced	Mechanically-Balanced
Internal	Internal "T"	Internal "double T"
	Internal "I"	Internal "I"
External	External "T"	External "I"
Hybrid		Hybrid "T"

Examples of fundamental resonant cluster via-types consisting of two or more vias connected in parallel. Dielectric layers required for support are not shown.

FIG. 22